# CEMENT MILL SECTION of
# CONCRETE

*The Cement Mill Edition of Concrete is edited exclusively for those interested in the manufacture of portland cement. Its pages are devoted to discussions of plant design, management, operation, production efficiency, chemical research and control, quarry operation, progress and news of the industry.*

*The Cement Mill Edition also contains all the material published in the corresponding Regular Edition and so provides news of the uses and merchandising of the materials whose manufacture is discussed in the Mill Edition. The Regular Section furnishes mill operating officials and mill executives valuable points of contact with the users of the materials they produce.*

Volume 41 January, 1933 Number 1

## CONTENTS

◆

**Cement Industry Cleared for Action** 35
Price stabilization, special cements, bulk shipment, and plant modernization seen as some fields of 1933 activity in what is also a review of the past year.

**Cloth Filters Collect Stone Dust in Raw Grinding Department *(Illus.)*** 37
Description of filter type of dust collection as installed at two plants of Missouri Portland Cement Co.

**Modernize Rock Crusher Drive with Synchronous Motor *(Illus.)*** 39
Instance of power factor correction installation described by Francis A. Westbrook.

**Clay Mining Methods and Costs at Aetna's Corunna Pit *(Illus.)*** 40
Oliver A. Dibble tells conditions and methods and gives cost figures.

**Editorial** 43
Where the Manufacturer of Machinery Can Help.
Modernize Without Increasing Capacity.
Converting Excess into Potential Capacity.
To Meet the Menace of Depreciated Currencies.

**Urges Adjusted Length of Work-Week as Cure for Unemployment** 44
Thos. E. Dabney outlines Odenheimer plan, proposed as offset to labor-saving machinery.

**Cement Statistics for November *(Illus.)*** 46

**Improvements, Developments Reviewed by Equipment Manufacturer *(Illus.)*** 47

**Mill Equipment *(Illus.)*** 48

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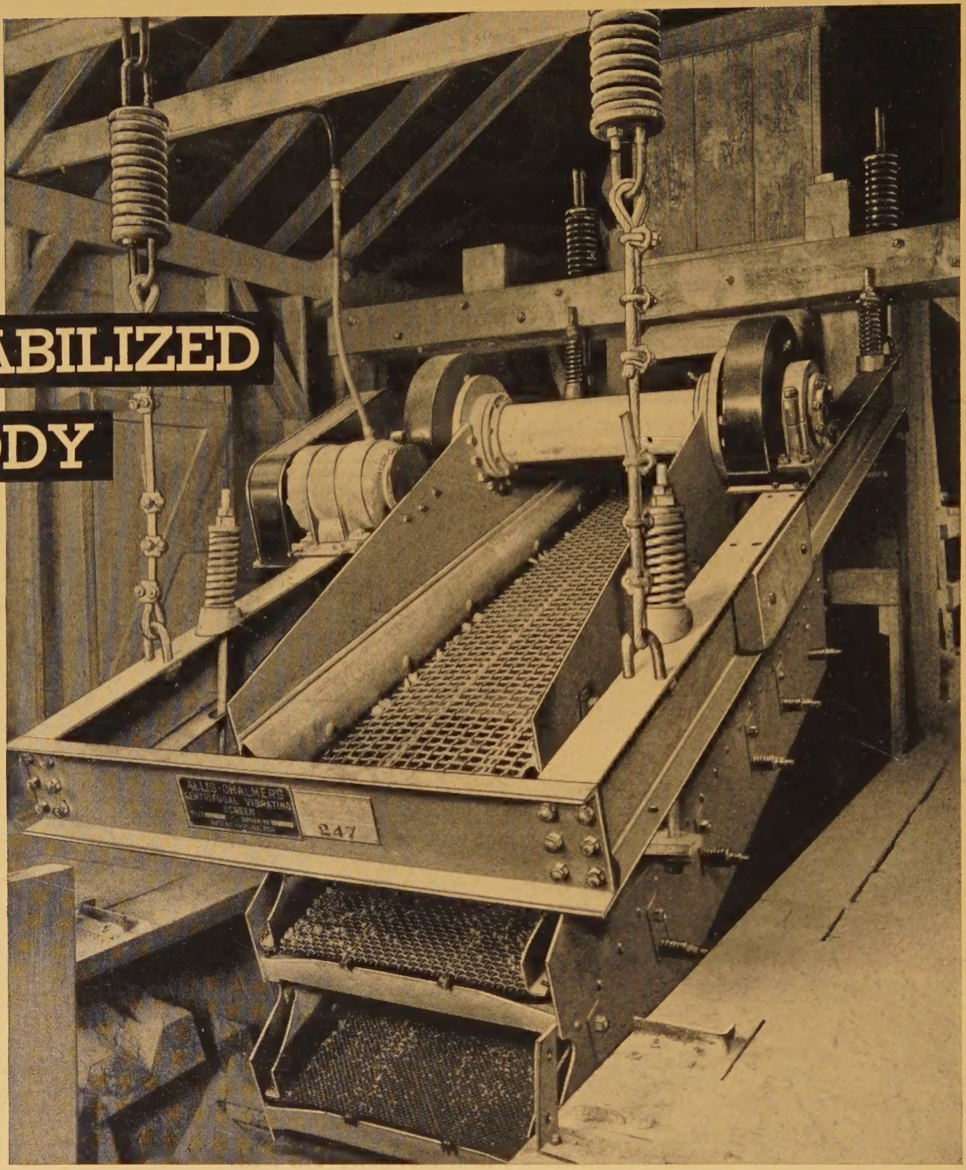
INDEX TO ADVERTISEMENTS

Allis-Chalmers Co. 34
Engineering & Designing 30
General Motors Truck Co. Back Cover
Kritzer Co., The 30

# SPRING STABILIZED SCREEN BODY



*3' x 10' Type B Centrifugal Vibrating Screen in a commercial stone plant, showing suspension of screen body to frame. Spouts removed to show screen better.*

The new Allis-Chalmers Type B Centrifugal Vibrating Screen incorporates a new method of supporting the screen body . . . . four compression springs, one at each corner. The balancing of the entire weight of the screen body and all moving parts removes this weight from the bearings and also forms a hanger for the screen body. The driving mechanism may be removed without disturbing other parts. The top deck and the other decks are entirely free from any obstruction, permitting free discharge.

Another feature of the Type B screen is the method whereby the proper crowning of the wire can always be maintained or changed to suit operating conditions and the thickness of the wire used.

These and other features were incorporated in the Type B screen after exhaustive shop and commercial tests which proved, among other things, a considerable saving in starting and running power. If you believe in plant rehabilitation it will pay you to investigate the possibilities of these screens and other Allis-Chalmers crushing plant equipment.

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Complete Crushing Plants
Complete Sand and Gravel, Washed Stone, Agricultural Limestone, Oyster Shell, etc., Plants
Cement Plant Equipment
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# ALLIS-CHALMERS

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*This advertisement is to help you get ready for better business*

# Cement Industry Cleared for Action

### New Year Opens with Greatly Improved Internal Situation—Prices Stabilized During Year—Modernization of Plants Most Difficult Problem—New Special Cements Enter Market—Year's Shipments Better Than Expected

ONE of the most hopeful and constructive developments within the cement industry in 1932 was the progress made toward stabilization of prices. During July and August price increases in varying amounts went into effect in practically all sections of the United States. On December 9 a further increase of 10 cents a barrel was announced in behalf of two of the International's plants, while the Alpha announced an advance of 29 cents a barrel in the Ironton (Ohio) district.

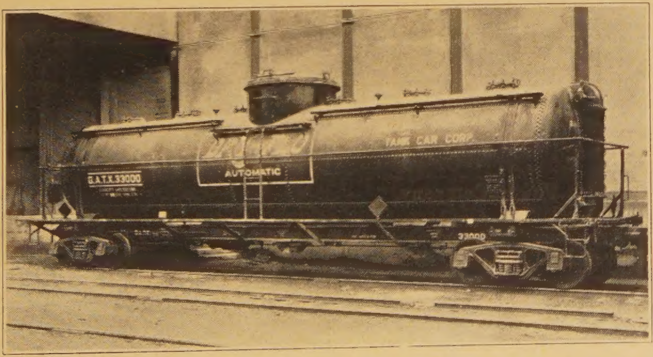
## Price Test Will Soon Come

If the price structure stands the strain of competitive bidding for state highway department contracts during the next few months, it may be expected that present price levels will hold. Until that gauntlet has been run successfully, it cannot be said that current price levels have passed the test, inasmuch as a considerable part of the shipments made since the July and August increases were made at the old prices—on contracts made just prior to the increases.

Even at present prices not all cement plants will be able to operate at a profit; but those plants which have been modernized—at least to the extent of present capacity requirements—should show some profit.

## Growth of Bulk Shipments

Bulk shipment of cement has been stimulated during 1932 from several sources. In the first place, manufacturers of equipment have developed and improved their equipment for receiving and handling bulk cement on construction projects and at products plants and central mixing plants.



**Self-unloading tank car for shipment of bulk cement and similar commodities**

One of the most interesting forward steps in the development of facilities for shipping bulk cement was taken by the railways themselves. During 1932 no less than seven railroads placed into service a specially equipped self-unloading hopper car[1] designed for the shipment of bulk cement and similar commodities. The car is unloaded by gravity. This type of transportation is particularly well adapted to the shipment of cement in bulk to large construction work, to concrete products manufacturing plants, and to ready-mixed concrete plants.

Another form of railway equipment, equally well adapted to the shipment of bulk cement, is a tank car developed and manufactured by the General American Tank Car Corp.[2] and placed into service early in 1932. This car is fitted with its own mechanical unloading equipment. Still further encouragement toward shipment of cement in bulk is seen in the completion of inland waterways during 1932, such as the Illinois Waterway connecting the Illinois and Mississippi rivers to Lake Michigan, and the extension of the Intra-Coastal Canal along the Gulf Coast region tributary to New Orleans. The expected opening of the Illinois Waterway in the spring of 1933 has brought out an announcement from at least one cement company having a plant on the Illinois river, to the effect that it will ship cement into Chicago in bulk cement barges. Others will doubtless follow the example, inasmuch as barge transportation of bulk cement is already a well-developed activity in the cement industry.

## Reduction in Manufacturing Costs

Some of the stronger companies in the cement manufacturing industry made notable advances during 1932 toward the goal of cost reduction, by means of new equipment installations. Prominent among installations of this character are the clinker coolers installed by the Marquette Cement Manufacturing Co. at its two plants. The Missouri Portland Cement Co., likewise has installed new equipment in its two plants, amounting almost to complete rehabilitation. The announced result is a reduction of about 26 cents per barrel in manufacturing costs.

## Facing Practical Difficulties

Unquestionably one of the most difficult problems facing the managements of plants that have not been modernized is that of plant rehabilitation. In all probability the executives of such plants are fully aware of the need for modernization, but the practical difficulties in the way of raising the necessary funds may be insurmountable in some instances.

## The Sintering Grate

One of the greatest possibilities in the direction of cost reduction brought to light during the year is the series of articles by T. H. Arnold, in the April, May and June issues of the Cement Mill Edition of CONCRETE, describing in detail the results being obtained in Europe in some ten or twelve cement plants which have installed what is known as the Lepol kiln. This burning equipment consists of a combination of a traveling sintering grate and a short rotary kiln. The raw material is heated approximately to the point of calcination on the sintering grate, after which a short rotary kiln completes the burning process. The heat is utilized with the utmost economy, with the result that fuel consumption is running less than 600,000 B.t.u. per barrel of clinker.

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[1] See Cement Mill Edition of Concrere, July, 1932, pages 34-35, for illustrated description of hopper cars.

[2] See Cement Mill Edition of Concrete, May, 1932, pages 60-62, for an illustrated article describing this equipment.

### Colored Cement Appears

Up to the year just closed white cement was the only colored cement produced in the Western Hemisphere aside from the familiar gray. As might be expected, the first positive step toward the development of the market for colored cement in the United States came on the Pacific Coast, where the commercial value of color is perhaps better appreciated than in other sections of the country. This move came from the Pacific Portland Cement Co., early in the year, when that company started the production of a tan-colored portland cement. The color is not merely an admixture, but is actually combined with the clinker during the burning process.

Later in the year the Yosemite Portland Cement Co. announced its intention of starting the production of a colored portland cement.

An interesting contribution to the subject of colored cement in which the color is developed in the burning process was published in the July (1932) Cement Mill Edition of CONCRETE, page 36. The processes there described are applicable to the production of clinkers of pure green, bright green and terra cotta red colors.

### Other Special Cements

A number of companies which have not produced high-early-strength cement prior to 1932 have entered that field during the past year, and several companies have introduced new masonry cements. Another interesting special cement has been introduced from Germany by the Medusa Portland Cement Co. It is described as a temperature-resisting cement,[3] consisting essentially of ordinary portland cement in combination with bitumen.

### Shipments Better Than Expected

The volume of shipments of portland cement reached a higher figure in 1932 than seemed probable earlier in the year. Doubtless the better showing in the latter part of the year was due in considerable measure to the impetus given to concrete highway construction by the fund of 120 million dollars made available in the Federal Relief Act.

With figures estimated for December, it is expected that the volume of shipments will have reached a total of about 81 million barrels by the end of the year, compared with 126,465,000 barrels in 1931 and with the all-time record shipments of 175,455,00 barrels in the peak year of 1928. After all, the cement industry in 1932 has shipped about 46 per cent of the volume shipped during the industry's greatest year. The unpleasant side of the story is that but little of it was shipped at a profit.

The new year opens with a better feeling within the industry than has prevailed for several years. Because of this improved morale it is believed that present prices will hold their ground, in which event the shipments during the coming twelve months will tell a better story from the standpoint of profit.

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[3] See Cement Mill Edition of CONCRETE, December, 1932, pages 44-45. Also November (1932) issue of CONCRETE, page 8.

## Federal Reserve District Committees Comprise Robertson Organization

The organization of the National Committee on Industrial Rehabilitation, headed by A. W. Robertson, chairman of the board of the Westinghouse Electric and Manufacturing Co., includes district committees in the twelve Federal Reserve districts of the country.

The membership of this organization also includes five members at large, several of whom are giving much of their time in aiding Chairman Robertson in his nation-wide campaign to make the work of the committee effective. The complete personnel of the committee includes the following:

*Chairman of the National Committee on Industrial Rehabilitation:* A. W. Robertson, chairman of the board of the Westinghouse Electric and Manufacturing Company.

*Members at Large:* E. T. Weir, chairman, National Steel Corporation; Malcolm Muir, president, McGraw-Hill Publishing Company; J. E. Lewis, president, Harbison-Walker Refractories Company; J. F. Tritle, vice-president, Westinghouse Electric and Manufacturing Company; H. S. Wherrett, president, Pittsburgh Plate Glass Company.

*Chairmen of Committees on Industrial Rehabilitation in the Federal Reserve Districts:*

First District (Boston)—Harry C. Knight, president of the New England Council and president, Southern New England Telephone Company.

Second District (New York)—Major General James G. Harbord, chairman of the Radio Corporation of America.

Third District (Philadelphia)—John E. Zimmerman, president of the United Gas Improvement Company.

Fourth District (Cleveland)—Randolph Eide, president of the Ohio Bell Telephone Company.

Fifth District (Richmond)—W. H. Meese, vice-president, General Electric Company.

Sixth District (Atlanta)—Theodore Swann, president of the Swann Corporation.

Seventh District (Chicago)—James D. Cunningham, president of the Republic Flow Meters Company.

Eighth District (St. Louis)—Albert B. Elias, president, Southwestern Bell Telephone Company.

Ninth District (Minneapolis)—R. F. Pack, president, Northern States Power Company.

Tenth District (Kansas City)—Frank Moss, president of the American Sash and Door Company.

Eleventh District (Dallas)—R. L. Thornton, president, Mercantile National Bank and Trust Company, Dallas.

Twelfth District (San Francisco)—William A. Ross, vice-president, Columbia Steel Company.

Cement plant executives who wish to enlist the aid of the committee in the solution of their own rehabilitation problems should first consult their district committee chairman concerning the particular form in which aid might be extended.

## Ideal Declares Dividend

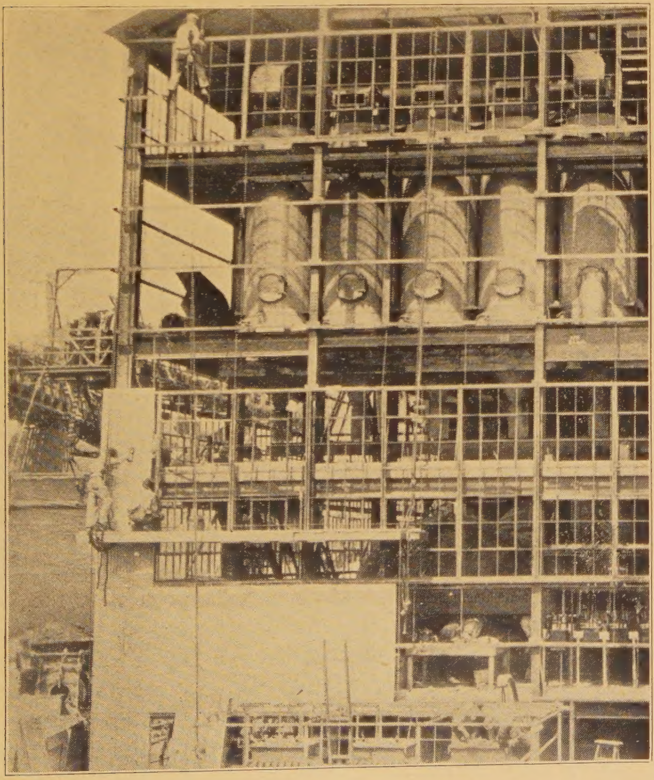
A quarterly dividend of 25 cents per share on its capital stock was declared by the Ideal Cement Co. on December 10, payable January 2 to stockholders of record December 15.

# Cloth Filters Collect Stone Dust in Raw Grinding Department

## Missouri Portland Installs Same Type of Collector at Both Plants—Automatic Shaking Device Removes Accumulated Dust — Part of Plant Modernizing Program

THE existence of dust in a cement plant was formerly believed to be detrimental to the health of the plant workers, for it was believed that the inhaling of the dust led to the development of serious respiratory and pulmonary diseases. In more recent years, however, this belief has been proved erroneous, a fact that was well demonstrated in tests conducted in a dry-process cement plant during a period of nearly three years, by the United States Public Health Service.[1]

On the other hand, the tests just mentioned did establish the fact that cement plant dust caused a tendency toward minor respiratory trouble, diseases of the skin, the eyes and the ears, rheumatism, and impairment of the digestive system. Men exposed to limestone dust were found to have experienced slightly more respiratory trouble than those working in cement dust.



One of two 5-compartment dust collector installations at Prospect Hill plant of Missouri Portland Cement Co., similar to the 5-compartment installation at Sugar Creek plant of same company

Aside from the elimination of the minor diseases just enumerated, the recovery of dust brings about a direct improvement of working conditions, and it increases the life of mill equipment by removing the abrasive effect of stone and cement dust coming into contact with moving parts. The stone dust that is returned to the kilns and the cement dust that is delivered to the cement storage bins have, furthermore, some commercial value. Again, when a cement plant is located in or near a town or city it is sometimes a matter of good diplomacy to remove what, in local parlance, is termed the "dust nuisance." This presents real or fancied damage to surrounding property, thereby removing a source of friction between the cement plant management and the townspeople.

### Many Types of Dust Collectors

Various methods are employed in the recovery of dust in cement plants, among which the following are general types:

(1) Centrifugal collectors.
(2) Adhesive type.
(3) Impact type.
(4) Washers and sprays.
(5) Dust settling chambers.
(6) Electrical precipitators.
(7) Cloth and screen filters.

Some of these types are better suited than others, to a given set of conditions, while under other circumstances the order of suitability may be reversed. In a word, each installation is more or less a problem in itself.

### Filter Type Collector

Collectors that operate on the principle of passing dust-laden air through cloth or screen filters are known as the filter type of dust collector. This type is well suited to the collection of dust in the raw grinding department, in the finish grinding department, in the packing department, and in other locations where the temperature and the moisture content of the dust-laden air or gas are relatively low.

### A Recent Cement Plant Installation

A recent installation of the filter type of dust collector may be seen in the raw grinding department of the Sugar Creek plant of the Missouri Portland Cement Co., where a 5-compartment collector of this type is hooked up with a newly installed compeb mill and two air separators. The dust collector is also connected to all screw conveyors,

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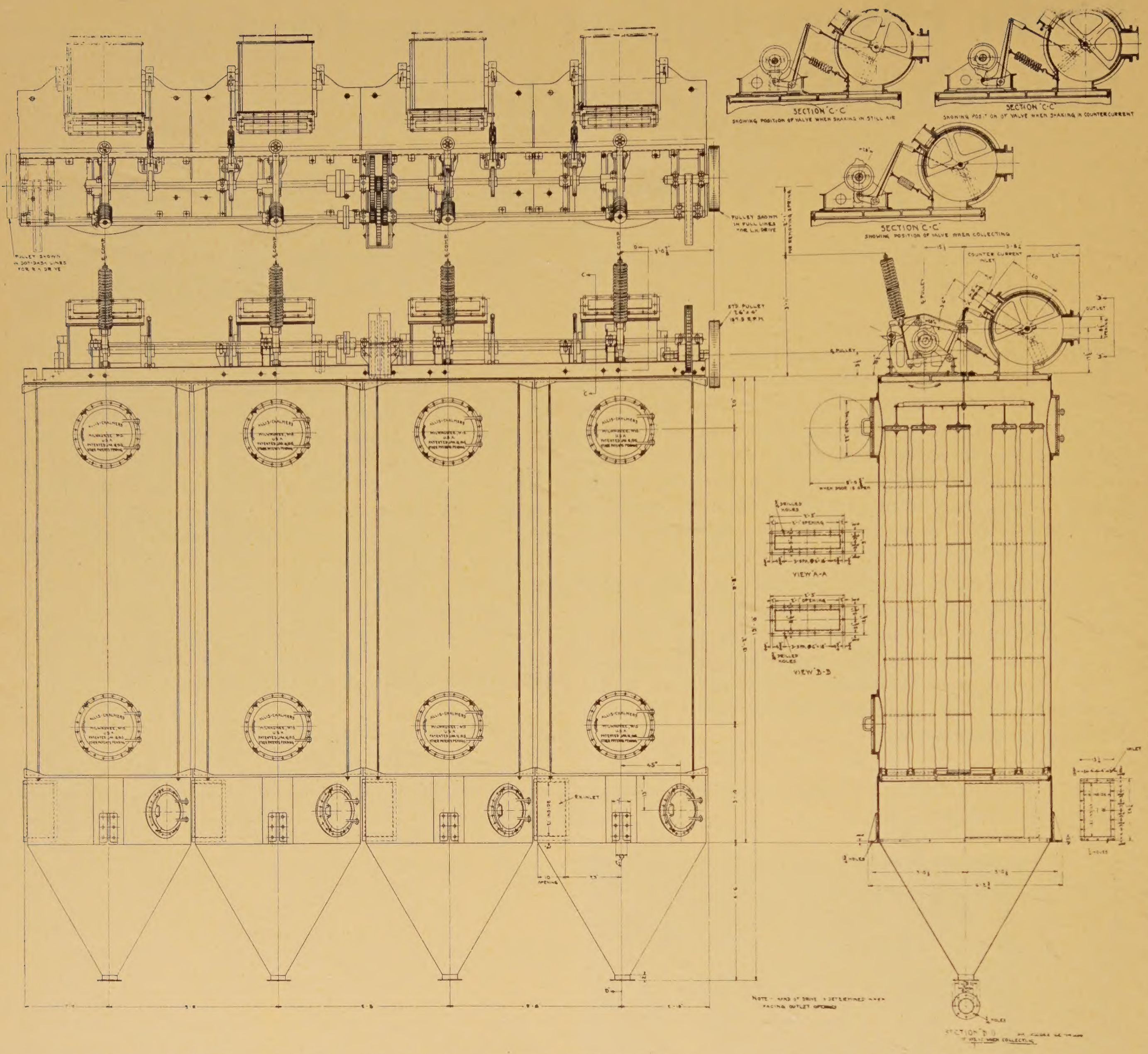
[1] See *Cement Mill Edition* of CONCRETE, April, 1930, pages 115-117, and May, 1930, pages 114-117.



**Details of filter type of dust collector, the type installed at both plants of Missouri Portland Cement Co.**

bins, scoop housings and elevators in the raw grinding end of the mill.

A similar dust collecting system, consisting of two 5-compartment units, was installed at an earlier date at the Prospect Hill plant of the same company.

The compeb mill in the hook-up at Sugar Creek is an Allis-Chalmers 3-compartment mill, 35 ft. long, with an inside diameter of 9 ft. 6 in. in the preliminary compartment and 8 ft. in the second and third compartments. The air separators which are hooked up in closed circuit with the mill are Raymond mechanical air separators each 16 ft. in diameter. Both the mill and the air separators were illustrated and described in considerable detail in the March (1932) issue of the *Cement Mill Edition* of CONCRETE, pages 51-55.

The material being ground at this plant is limestone and shale.

The filters employed in this dust collector installation are of Allis-Chalmers manufacture. Cloth bags are used as the filtering medium. Each of the five compartments contains 625 sq. ft. of filtering area, so that the total installation contains 3,125 sq. ft. of cloth.

### Automatic Shaking Device

Au automatic shaking device is provided, which shakes each of the compartments at intervals of five minutes. The device is operated by a 3-hp. electric motor. The shaking cycle consists of shaking for a short period with the air pressure inside and outside the bag balanced, to remove the dust that has accumulated on the inside face of the cloth. Then the valves controlling the mechanism are changed, resulting in the admission of a counter current of air which creates a suction on the inside of the bag at the moment when clean air is admitted to the outside of the bag. This reversal of the air through the cloth walls of the bag results in a thorough cleaning of the pores of the cloth. During these two periods of the shaking cycle the bags are being shaken continually.

All operations of the dust collector are controlled by means of cams and gears from one drive motor. The suction through the compeb mill and dust collector is maintained with a 30-hp. Allis-Chalmers motor connected to an American Blower Company fan. An approximate volume of 8,000 cu. ft. of air per minute is being drawn through the compeb mill, the elevator housing and the sump housing.

The operation of the dust collector produces a clean mill room that is in strong contrast to the raw grinding departments of former times.

The 5-compartment dust collector installation at the Sugar Creek plant is, as stated, of the same type as the 10-compartment installation placed in the same company's cement plant at Prospect Hill, near St. Louis. Both installations are parts of the program of plant modernization inaugurated by the Missouri Portland Cement Co. several years ago.

## International and Alpha Lead in Price Boost

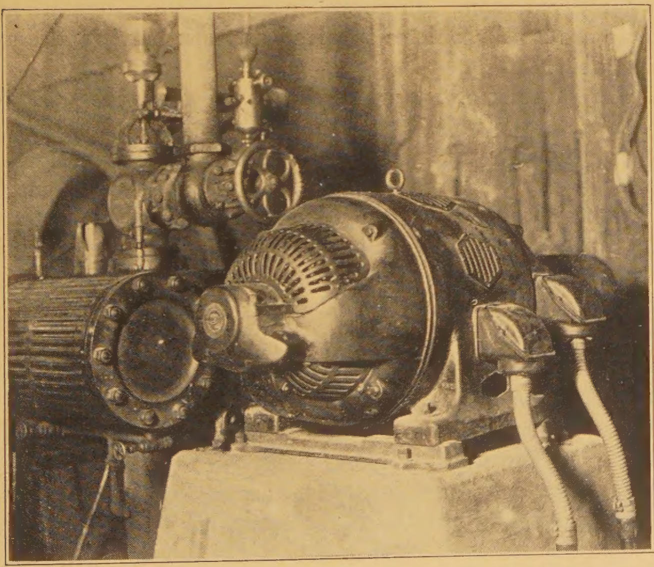
Taking the lead in a price increase, the International and Alpha companies early in December sought to return production to a profitable basis.

The International firm announced an advance of 10 cents a barrel at the Limedale, Ind., and Bonner Springs, Kan., plants. The Alpha company boosted prices 29 cents a barrel in the Ironton, Ohio, district.

# Modernize Rock Crusher Drive With Synchronous Motor

By **FRANCIS A. WESTBROOK, M.E.**
**Consulting Engineer, Center Conway, New Hampshire**

THE motor shown in the illustration is driving a rock crusher which runs with a highly intermittent load. When a car full of rock is dumped into the crusher the full power of the motor is called for, but after it has passed through there may be a delay of a few minutes, during which time the crusher is running free. Rather a low speed is also desirable. This results in low power factor unless corrective measures are taken. This correction may be secured by means of a synchronous motor driving a machine which runs constantly, such as this crusher.



**A 50-hp., 900-r.p.m. synchronous motor driving a rock crusher, replacing the steam engine shown in the picture**

The use of this type of motor is particularly advantageous with the crusher because if a squirrel-cage motor were used of sufficient size to carry the full load it would operate at an extremely low power factor when running free. All things considered, therefore, this is the ideal point for power factor correction.

The application of corrective equipment applied in this instance is a 50-hp., 900-r.p.m. Fynn-Weichsel motor. It was installed to replace the steam engine shown in the photograph as a step in the direction of modernization of the plant.

It was a very complete job in that it was not just "electrified," but the work was done with a clear understanding of the needs of an efficient electrical installation, which called for adequate consideration of the need of a high power factor, a matter all too frequently neglected and one often leading to excessive power wastes with correspondingly high power costs.

## Baseball Heads Enter Cement Field Via Reorganized National Co.

Two baseball magnates are among the officers elected late in November to head the reorganized National Portland Cement Co. of Brodhead, Northampton County, Pa. They are Wm. M. Richardson, of Philadelphia, president of the Philadelphia Export Co., and vice-president of the Washington American League Baseball Club, and John D. Shibe, vice-president of the Athletics. They have been elected president and treasurer respectively, of the cement company.

Other officers recently elected are Fred B. Franks, Allentown, vice-president and general manager, and George M. Richardson, Philadelphia, secretary.

# Clay Mining Methods and Costs at Aetna's Corunna Pit

## *Sampling Methods, Shovel Operation, Transportation, Moving and Maintenance of Tracks—Cost Data—Clay Supplied for Two Mills*

*By* **OLIVER A. DIBBLE**
**General Superintendent,* Aetna Portland Cement Co., Fenton, Mich.**

THE open-pit recovery of clay for cement plants is a comparatively simple operation in comparison with underground mining of clays; nevertheless, it represents an appreciable factor in the cost of cement manufacture. The article here presented deals specifically with the methods employed by the Aetna Portland Cement Co., which operates cement mills at Fenton and Bay City, Mich., in recovering clay from their pit at Corunna, Mich., on the Grand Trunk Western Railway. The cost tabulations given represent operating expenditures only.

### Physical Characteristics of the Deposit

The Corunna pit comprises approximately 100 acres, of which 80 have been dug over to an average depth of 12 ft. The remaining 20 acres are estimated to contain 380,000 cu. yd. of available material, averaging 15 per cent sand.

Those sections of the deposit which were first worked were low in sand. The last deposit (Rose farm), however, contains considerable sand, and consequently the material is more difficult to grind to the required fineness. There is no definite stratification to the clay and on this particular deposit there is practically no overburden. The little overburden is a clayey soil which mixes well with the clay and causes no difficulty. Occasionally pockets of sand and gravel are found in the clay. These are of irregular occurrence and are shoveled to one side as the clay is removed.

### Sampling Methods

Due to the sand and gravel pockets, accurate sampling of the deposit is difficult and the results are not always representative. If a sand pocket is struck it is bound to contaminate the sample, and it is impossible to determine the area of usable clay without a great many test holes. However, test holes give a fair idea as to the location of available material, and they are put down every 50 ft. for each shovel cut. Two men with an auger can sink an average of five holes in 10 hours. The cement plant laboratories run the samples during spare time. One man can run approximately 20 samples in a 10-hour day.

Sand content is an important factor in clay, due principally to its high resistance to grinding, as fine preliminary grinding is essential to good burning and a fine finishing grind is essential to high quality in portland cement.

The determination of sand in the clay is made from samples taken as follows: The auger is sunk about 6 in. at a time and then pulled, and a small sample is taken from each inch of the auger and placed in a bag. Separate bags are used for the material from each 5 ft. of hole; if a definite change in the deposit is observed at any time, a new sample bag is used, and the depth at which the change occurred is noted.

The samples are then sent to the laboratory, dried, ground, and a 100-gram sample is washed through a 100-mesh sieve. The oversize is dried and weighed, the weight being the percentage of sand in the clay.

### Mining Method

The method of mining is simple. The clay is dug in a single bench by two steam shovels which load directly to the railroad cars. However, in year-around operations there are such problems involved as track moving, drainage, and blasting.

The shovel cuts are approximately 50 ft. wide and 10 to 20 ft. in vertical depth, averaging about 12 ft. The larger shovel takes a full 50-ft. cut, while the small one takes about 40 ft., so that when the two shovels meet either the larger shovel continues and finishes the cut or the small shovel doubles back, depending on the demand for material and the length of the cut. The cut now being made is approximately 500 ft. long, and the two shovels load from 450 to 500 tons per day.

When a cut is completed all waste material is thrown over the track out of the way, and a tractor and men move the track into position for the next cut.

The pit is worked 10 hours a day with two shovels and an average crew of 8 men. The actual digging does not begin until 8:30 or 9 a. m., as steam has to be raised in the shovel boilers. During this delay the men are employed in track maintenance.

The large shovel with the 1-yd. dipper can load a 50-ton car in 25 minutes and the smaller shovel with the ⅝-yd. dipper can load a car in one hour. In extremely cold weather it is sometimes necessary to blast to loosen the clay ahead of the shovel. In this case 2-in. holes are drilled and light charges of dynamite are used. However, the blasting done during the year is negligible.

The requirements of the two cement mills do not demand the total capacity of both shovels. The present cut

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Condensed reprint from U. S. Bureau of Mines Information Circular 6657.

*One of the consulting engineers, U. S. Bureau of Mines.

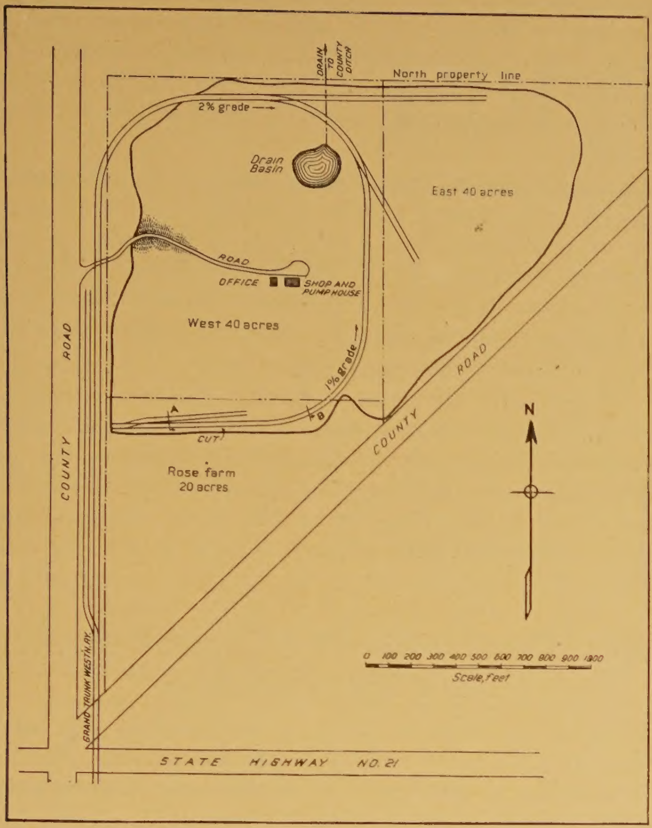

**Figure 1. Property map of Aetna's clay supply at Corunna, Mich.**

is high in sand at one end and low at the other. The Bay City mill can use the clay with the higher sand content but the Fenton mill cannot; hence the two shovels are used to dig the different types of clay for the respective mills. A beneficial change could be made by using a ¾-yd. dipper on the 1-yd. shovel. The clay is hard to dig, due to its cohesiveness, and the use of an over-powered shovel would materially lengthen its life while not appreciably decreasing production.

TABLE 1. CLAY-PIT COSTS AT CORUNNA PIT

Period, Feb. 15 to Dec. 15, 1931.
Tonnage excavated, 112,500.

| Labor, operation: | Man-hours | Pay roll | Cost per ton |
|---|---|---|---|
| Supervision | 2,300 | $1,548.00 | $0.0138 |
| Engineer | 4,320 | 1,944.00 | .0173 |
| Firemen | 4,320 | 1,728.00 | .0153 |
| Pitmen | 6,040 | 2,416.00 | .0215 |
| | 16,980 | 7,636.00 | 0.0679 |
| Labor, track moving: | | | |
| Supervision | 100 | 67.30 | .0006 |
| Labor | 920 | 379.50 | .0034 |
| Tractor and driver | 150 | 150.00 | .0013 |
| | 1,170 | 596.80 | 0.0053 |
| Labor, track maintenance: | | | |
| Supervision | 200 | 134.70 | .0011 |
| Labor | 2,600 | 1,072.50 | .0095 |
| | 2,800 | 1,207.20 | 0.0106 |
| Labor, total | 20,950 | 9,440.00 | .0838 |
| Material: | | | |
| Coal, tons | 150 | 637.50 | .0057 |
| Repairs* | ----- | 1,122.30 | .0100 |
| | | $1,759.80 | $0.0157 |

TOTAL COSTS

| Labor: | Man-hours | Cost | Cost per ton |
|---|---|---|---|
| Operating | 16,980 | $7,636.00 | $0.0679 |
| Track moving | 1,170 | 596.80 | .0053 |
| Track maintenance | 2,800 | 1,207.20 | .0106 |
| Material: | | | |
| Coal | ----- | 637.50 | .0057 |
| Repairs | ----- | 1,122.30 | .0100 |
| Team | ----- | 650.00 | .0057 |
| Total | 20,950 | $11,849.80 | $0.1052 |

Total man-hours per ton, 0.1862

*Track, ties, and rails, etc., included in this item.

## Transportation; Moving and Maintaining Tracks

The railroad switch engine places the empties and takes out the loaded cars about 7 a. m. If the cut is short the engine switches the empty cars to the siding on the upper grade of the track, which is on the south side of the pit (see A, Figure 1), and as cars are required they are switched out with the shovel winches.

Track moving is necessary about every three months. It delays mining and is a costly operation, especially in wet weather, while in dry weather it means a delay of 1½ days with little extra cost.

When a cut is completed all cars are switched out, all waste is thrown out of the way, and the track is cut in two places, at A and B (see Figure 1). A local farmer and his tractor are hired to assist the regular pit crew. The track is pulled into the new position, and ties and rails laid to connect it with the unmoved track. In dry weather cinders are then tamped around the ties for ballast, but in wet weather the cinders must be laid first and a larger crew is necessary. Moving and preparing the track for temporary use takes about 2 days of 10 hours each, and an average of about 100 man-hours is required in addition, to bring the track to standard condition. This additional work is done by the regular operating crew during their spare time.

TABLE 2. SHOVEL-OPERATING COSTS AT CORUNNA PIT

Period, Feb. 15 to Dec. 15, 1931.

Shovel, Type A 1 cu. yd. dipper.
Material handled: Overburden 5,000 tons
Clay 68,750 tons

| | Clay | | Overburden | | Total |
|---|---|---|---|---|---|
| | Amount | Cost per ton | Amount | Cost per ton | cost per ton clay |
| Enginemen | $ 502.00 | $0.0073 | $100.00 | $0.020 | $0.0088 |
| Firemen | 449.00 | .0065 | 90.00 | .018 | .0078 |
| Pitmen | 669.00 | .0097 | 74.00 | .015 | .0108 |
| Foremen | 403.00 | .0059 | 80.00 | .016 | .0070 |
| Fuel | 145.00 | .0021 | 30.00 | .006 | .0025 |
| Repairs | 290.00 | .0042 | 60.00 | .012 | .0051 |
| Total | $2,458.00 | $0.0357 | $434.00 | $0.087 | $0.0420 |

Shovel, Type O ⅝ cu. yd. dipper.
Material handled: Overburden 10,000 tons
Clay 43,750 tons

| | Clay | | Overburden | | Total |
|---|---|---|---|---|---|
| | Amount | Cost per ton | Amount | Cost per ton | cost per ton clay |
| Enginemen | $ 274.00 | $0.0063 | $ 91.00 | $0.0091 | $0.0083 |
| Firemen | 235.00 | .0054 | 78.00 | .0078 | .0072 |
| Pitmen | 337.50 | .0077 | 112.50 | .0112 | .0103 |
| Foremen | 219.50 | .0050 | 73.50 | .0074 | .0067 |
| Fuel | 94.70 | .0022 | 32.80 | .0035 | .0029 |
| Repairs | 159.00 | .0036 | 53.00 | .0053 | .0048 |
| Total | $1,319.70 | $0.0302 | $440.80 | $0.0441 | $0.0402 |

A continual track maintenance is carried on by the regular crew to the extent of about 10 man-hours per day in addition to supervision. Maintenance, of course, requires more time in wet weather than in dry.

A team is employed continuously for hauling supplies, such as coal. There is a general pipe and forge shop for temporary repairs. A ½-hp., 2-cycle gasoline engine with 3-in. bore and 5-in. stroke drives a 3-cylinder, 8-in. duplex pump which delivers 30 gal. of water per minute to the shovels against a 15-ft. vertical head. An interesting fact regarding this engine is that it has given seven years service with a repair cost of only $2.45.

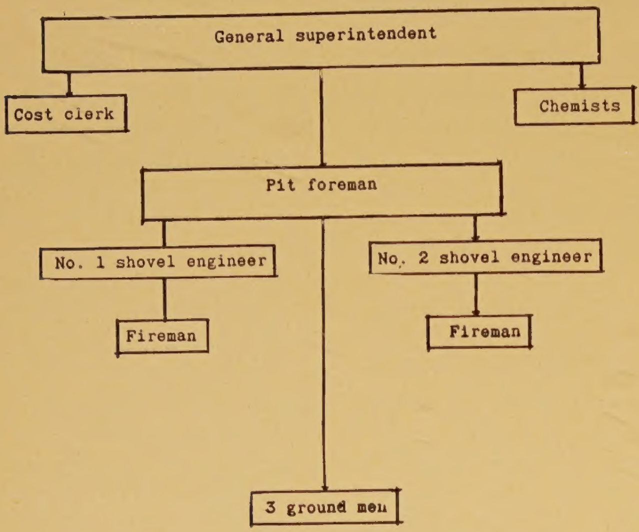

**Figure 2. Organization of operating personnel**

Figure 2 shows the organization of the operating personnel. The wages paid are as follows:

WAGE SCALE

| | Monthly basis | Hourly basis |
|---|---|---|
| 1 foreman | $175.00 | ---- |
| 2 enginemen | ---------- | $0.50 and $0.45 |
| 2 firemen | ---------- | ---- |
| 3 laborers | ---------- | ---- |

Tables 1 and 2 show the operating costs at the Corunna pit. These figures cover the cost during actual digging time only; maintenance labor costs are not included.

## Proposes to Raise Tariff as Offset to Depreciated Currencies

### Principles of Measures Adopted by France, Germany, Spain and Canada Embodied in Congressional Bill

Representative Samuel B. Hill, of Washington, has introduced a bill to provide support for the American dollar in its battle with depreciated foreign currencies.

A flood of imports from more than 40 countries which are off the gold standard has caused widespread complaints from American farmers and manufacturers to Congress, to the Commissioner of Customs, to the Chamber of Commerce of the United States and to other civic agencies. Hundreds of American factories, mills and mines are said to be operating at a loss as the result of this destructive competition with countries whose currency has been debased. Grievances of the cement industry arising from this source were discussed in several of the recent issues of the Cement Mill Edition of CONCRETE, notably on page 41 of the December issue.

Representative Hill claims that the bill goes direct to the heart of the problem by authorizing a tax on imports from such countries equal to the difference between the value of the dollar and the value of the depreciated currency of the exporting country at the date the shipment is made.

France, Germany, Spain and Canada, it is pointed out, quickly adopted the principle of this bill to prevent dumping of goods into their home markets from depreciated currency countries. It was possible for France and some other nations to do this by ministerial decree or executive order, but it can be done by the United States only by the slower process of legislative action.

"No one will tolerate the reduction of American wages to foreign levels to meet this ruinous competition," says Mr. Hill. "The tax proposed in this bill is the only way of stemming the flood of imports from countries with depreciated currencies. More than half of our imports now come from such countries."

## West Coast Four-Ply Cement Merger Nears Materialization

Merger proposals involved in the combine that will bring into being the Standard Cement Company were to be submitted to shareholders of the four Pacific Coast cement companies involved late in December.

It was believed the new organization might be in operation as early as January 1.

Details of the setup have been in the process of formation before submission to directors and stockholders of the Santa Cruz Portland, Pacific Portland, Calaveras Cement and Yosemite Portland Cement companies. Combined output of the five plants entering into the consolidation amounts to about 23,000 bbl. daily. Amount of capitalization was placed at 200,000 shares of no par stock of stated value of $10 a share.

Geo. T. Cameron, president of the Santa Cruz and publisher of the San Francisco *Chronicle*, will become chairman of the Standard Cement board of directors. Robert B. Henderson, president of Pacific Portland, will be president, and Col. Geo. R. Gay of Santa Cruz Portland, will be vice-president and general manager.

The principal place of business will be at San Francisco.

All of the assets of the merging companies with the exception of the Pacific company's two plaster mills will enter the Standard picture.

The merger, rumored for years, is believed to have been brought to a head by the probability of the construction of two San Francisco Bay bridge spans in the near future.

## One Lehigh Plant Resumes; Second Promises Early Operation

The Lehigh plant at Fordwick, Va., reopened on December 8 after having been closed for several months. At the same time announcement was made that the Metaline Falls, Wash., plant would resume operations by March 1, if not earlier.

Relining of the kilns at the Virginia plant was recently completed.

# EDITORIAL

## *Where the Manufacturer of Machinery Can Help*

AT this moment three outstanding facts have combined to give the manufacturer of cement mill machinery an unusual opportunity.

The first fact is that many cement mills are in urgent need of almost complete rehabilitation if they are to operate at a profit at present price levels. The second fact is that the last two or three years have seen unusual advances toward the development of cost-reducing cement mill equipment and processes. Third, some of the mills that are most in need of rehabilitation will find it difficult to finance new installations or to engage independent technical talent for the purpose of determining what new installations are most urgent.

In the last-named fact lies the opportunity for the manufacturer of cement mill machinery. The first thing needed in a plant that is trying to operate with obsolete equipment is a complete plant survey by an independent cement mill engineer of proved ability. The manufacturer of cement mill machinery who is in a position to offer the services of a practicing engineer of established reputation will be in a position to perform a service that clearly could be classed as intelligent self-interest.

Such a survey will uncover the weak spots, the places where money is being wasted by obsolete equipment. It will indicate the character and cost of modern equipment needed to meet the requirements of the 1933 output.

Of even greater importance is the fact that a report from a practicing engineer of recognized ability, showing the cost of modernizing a plant and the expected reduction in production costs, will serve as a definite aid in financing the needed installations.

Co-operation of this character between the equipment manufacturer and the cement manufacturer may result in business for the former and profitable operation for the latter.

## *Modernize Without Increasing Capacity*

CEMENT plant modernization need not mean increased capacity. A properly planned rehabilitation program will call for the installation of only enough modern machinery and its auxiliary equipment to provide for the production of the expected share of the coming year's business.

In 1932 the cement industry operated at a little less than one-third of its capacity. A moderate increase is expected for 1933, probably reaching 40 per cent.

In consequence, wise management calls for the replacement of only enough obsolete equipment to provide a modernized capacity of around 40 per cent of the old plant capacity. A plant thus partially modernized will be in a position to get its share of the business, and to produce it at a profit.

Plant rehabilitation that is carefully planned in the light of expected business will not create more capacity; it will only modernize the capacity that is actually being used.

## *Converting Excess into Potential Capacity*

IT is well recognized that much of the present excess capacity in the cement industry is represented by obsolete and worn-out equipment that should no longer be used for the manufacture of cement. Such equipment cannot show an operating profit at current prices.

The ideal situation for the industry as a whole would be realized if all of the actual output were produced by modern machinery, and only obsolete machinery were idle. This unused excess machinery could then be scrapped and replaced if and when business conditions call for such action. In a word, excess capacity would become potential capacity.

The individual plant that approaches most closely to this ideal situation will be in a strong position during 1933.

## *To Meet the Menace of Depreciated Currencies*

IN several recent issues of the Cement Mill Edition of "Concrete" reference has been made to the grievance of the cement industry arising from the dumping of cement imported from countries having greatly depreciated currencies. Other industries, of course, have suffered from similar causes.

By going off the gold standard some countries have depreciated their currencies to points which constitute, in effect, radical reductions in wages. Now these countries are producing cement and other commodities so cheaply that they can pay ocean transportation costs, pay all customs duties, and still land their products in the American market at costs below the cost of production in the United States.

A bill introduced in Congress by Representative Samuel B. Hill, of Washington, would get at the root of the difficulty by authorizing an additional tax on imports from countries with depreciated currencies, proportional to the percentage of depreciation.

The Hill bill embodies the principles of measures enforced successfully by several European countries to prevent dumping of imports. This bill deserves the active support of the cement industry.

# Urges Adjusted Length of Work-Week As Cure for Unemployment

### New Orleans Manufacturer Would Make Plan Compulsory—Believed Necessary Even In Prosperous Times as Offset to Labor-Saving Machinery—Effect on Purchasing Power

*By* Thomas Ewing Dabney
*Financial Editor, New Orleans States, New Orleans, La.*

"MAKE the Teagle committee's share-the-work principles permanent in American industry; put the enforcement of the United States government behind it."

That is the proposal of S. Odenheimer, New Orleans manufacturer, for permanent unemployment relief. It is the only solution of a situation that is threatening American civilization, he says.

He proposes that the federal government be given the power, by constitutional amendment, to make the work-week long or short, in order to balance production with consumption, and provide work for everybody. If the plan were put into effect now, he says, employers would be justified in immediately increasing wages 10 per cent.

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**MAKING the work-week long or short does not mean that actual operations should be affected. Obviously, the work-week from an operating standpoint can not be made longer than seven days, or 168 hours. To restrict operations would be to abolish industry. The work-week refers to the number of hours laborers may be employed.**

**The situation today is this: One out of every four of the working population of the United States is out of a job. Mr. Odenheimer's plan contemplates the establishment of a commission, a permanent one, which would keep a close watch on industrial and economic conditions, and balance the hours of labor available with the number of laborers by lengthening or shortening the work-week. If the system were in effect today, for instance, everybody would have a job of some sort. It would be part-time, but it is better for four men to have part-time work than for three to have full-time and one to be walking the streets seeking charity or turning to crime.**

**There might be some difficulties, in some industries, in putting the plan into operation; but our present difficulties are not so light that they are to be preferred to the troubles of operating readjustment.**

**It is a common thing, when times are booming, to work two and even three shifts a day. The force is doubled or trebled from the original force. It is something of a bother to train the extra men needed, but they are trained as a regular thing. Therefore, today it would be feasible to train outsiders into the operating mysteries of every industry and business so that they could have a little work, and the regular force have a little less work.**

**The American Federation of Labor has adopted the principle of the shorter week—a 30-hour week. That is one step toward the Odenheimer plan. The Teagle committee is trying to get industry and business to spread the work so that the four men will be given a job instead of having three men at work and the fourth idle. That is another step towards the Odenheimer plan.**

**Combine the two, make the system obligatory on all industry and all business, and add the principle of adjusting the work-week up or down as production increases or decreases (with consumption), and you have the full Odenheimer plan.—The Author.**

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### A Business Man's Views

Mr. Odenheimer is not a theorist, not a dreamer, but a hard-headed business man. He is president of the Lane Cotton Mills in New Orleans, capitalized at two and a quarter million dollars and spinning 50,000 bales of cotton a year. Since 1885 he has developed an insignificant spinning plant into one of the most successful operations in the country. Within the last few weeks he has completed an addition that doubles his output, and he is working full-time, with orders far ahead.

He belongs to a class that has always been fiercely resentful of the government's interfering in business, but he says there is no way out of the economic complications of the world, except through governmental regulation of the work-week. He has submitted his plan to William Green, president of the American Federation of Labor; to President Hoover; to President-elect Roosevelt; to the Secretary of Commerce; to the Secretary of Labor; and to the Senators and Congressmen of the United States.

Unemployment problems are going to be bitter even after the depression, he says, because of the increased use of labor-saving machinery, to which added impetus has been given in recent months as manufacturers have sought to reduce producing costs. Hence, relief must look to the future as well as to the present.

The Odenheimer plan for permanent unemployment relief faces the fact that we are confronted with a great emergency. It is said that the unemployed in this country equal the unemployed in all European countries. From a humanitarian standpoint, it is the severest shock we have ever experienced. Viewing it in the light of the safety for our institutions, and for the permanence of our present civilization, it is a menace of incalculable proportions. There is only one remedy, and that is through an amendment to the constitution of the United States, empowering Congress to legislate on hours of labor.

Once this amendment is passed, Congress would provide an "Hours of Labor Commission," members of which would be appointed by the President. The law would make it mandatory that one week after the commission is appointed, it should issue a proclamation that the hours of labor of all industries, work shops, stores, etc., should not exceed a certain number of hours per week.

The enforcement of this law would be vested in the President. The law would provide that violation be punished by imprisonment of the employer of not more than two days and a fine of not more than $500 for the first offense, and for the second and subsequent offenses, not less than 30 days imprisonment and fine not exceeding $10,000.

### Operation of the Plan

The Hours of Labor Commission would probably find that, at the present time, not more than 25 hours work per week would be necessary in order to provide employment for everyone at once. In a short time, say a few weeks later, the commission would find, due to the better feeling all around, a larger number of hours necessary to supply the country's needs. From time to time, as justified by conditions, the commission would change the number of hours.

### Constitutional Amendment Needed

This great emergency justifies the immediate calling of Congress to pass on the submission of the constitutional amendment to the legislatures of the states. The legislatures should then meet at once and vote on the amendment. It is possible that the constitutional amendment would be a law in less than 60 days.

The employment of all the people would relieve the great strain we are living under. It would at once increase the consumption of everything. The employer would be justified in increasing wages in all vocations at least 10 per cent, where wages have been reduced lately, and in a very short time probably as much as 25 per cent, if not more.

### Increasing the Purchasing Power

Mr. Odenheimer adds: "Consuming and purchasing power would be increased first by the general distribution of wages, which are now confined to a part of the work-army, and second by the lessening of the fear of unemployment tomorrow by those who have jobs today."

He continues: "The Secretary of Commerce of the United States estimates today's unemployment at 10,000,000. President Green of the American Federation of Labor estimates it at 11,000,000. That is to say, nearly one-quarter of the normal working population of the United States is now without employment.

"Furthermore, there is much part-time employment. Trade union reports set the proportion of employed union workers on part time at 22 per cent. The percentage among non-union workers is much larger—52 per cent, according to the 13,726 establishments reporting to the U. S. Bureau of Labor statistics in September.

"Or look at it this way: While employment in manufacturing activities dropped 17.5 per cent during the year ending in September, the payrolls in the same plants dropped 32.8 per cent. Manufacturing payrolls have been cut 62.3 per cent since 1929, which, with adjustment for the decline in the cost of living, indicates a 50 per cent drop in real purchasing power. Thus has consumer-buying been undermined not only by the rising tide of unemployment, but also by the shorter working hours, wage reductions, and the displacement of highly paid workers by low paid labor.

### Something Must Be Done About It

"The unemployment outlook is dark. The seasonal peaks of activity have been passed in most directions. Cold weather is coming, and more men are going to be thrown out of work as construction and other activities, which contract when the winter blizzards rage, drop to low speed. President Green of the American Federation of Labor estimates that the unemployment figures will be 13,000,000 by midwinter. Even if this is an overestimate, and it runs no higher than 12,000,000, the forecast of one of the country's more conservative statistical organizations, that figure will be a new high record.

"And I say it is up to us to do something. The relief measures are not adequate. The share-the-work campaign of the Teagle committee does not have sufficient enforcement behind it. My plan is simply to make permanent and effective the principle of the Teagle committee to have everyone employed."

## ✦ NEW BOOK ✦

### Industrial Management

INDUSTRIAL MANAGEMENT IN THIS MACHINE AGE, by Francis A. Westbrook. Published by the Thomas Y. Crowell Co., New York. Cloth, 407 pages, 5¾ by 8½ in., chart illustrations. Price $3.50.

In collecting data for this volume the author has followed the policy of getting his information first-hand, through visits to plants and plant executives, and through correspondence and visits with numerous industrial managers, professional societies, trade associations and business paper editors. As a result, the discussions throughout the book identify the various functions of management with the best current practices, through the illustration method.

Considerable space is given to the chapter on stabilizing employment, where the so-called Rochester plan and the Wisconsin unemployment insurance law are discussed in detail.

While no specific manufacturing industry was in the author's mind, plant managers and other executives of the cement industry will find much valuable and usable information in this book.

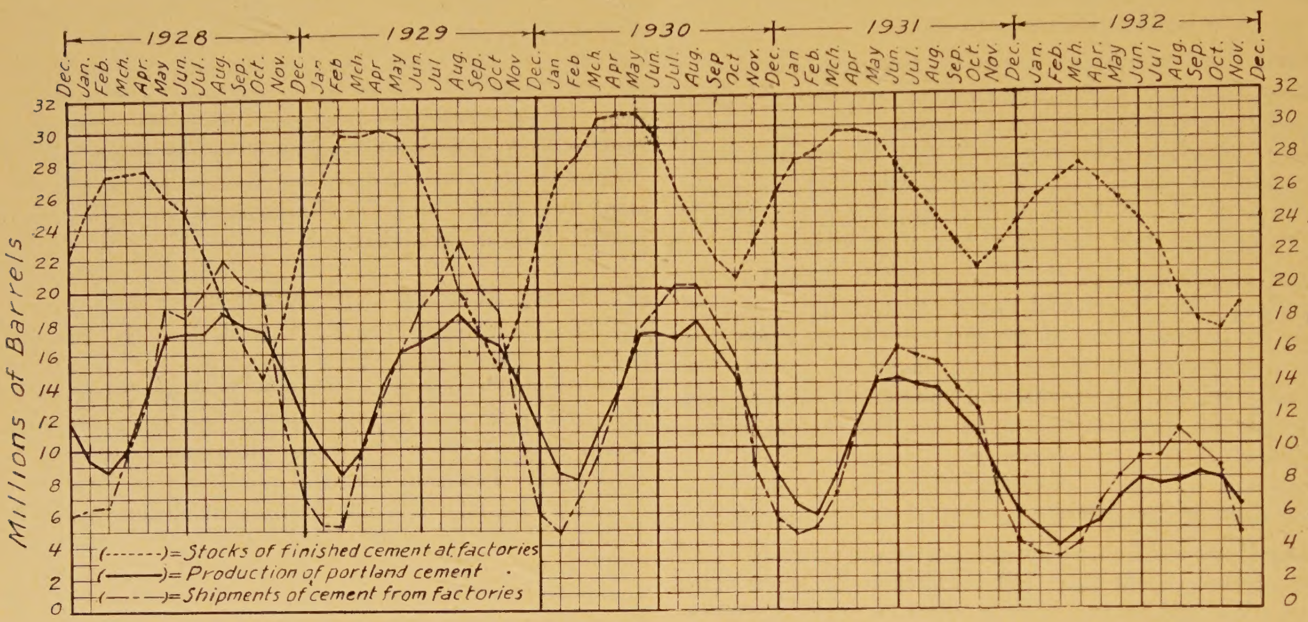
# Cement Statistics for November

### Relation of Production to Capacity

| | The Month | Twelve Months |
|---|---|---|
| November, 1932 | 29.1 | 29.0 |
| November, 1931 | 37.2 | 44.4 |
| October, 1932 | 34.6 | 29.6 |
| September, 1932 | 36.9 | 30.6 |
| August, 1932 | 34.2 | 32.1 |

### Production, Shipments and Stocks of Finished Portland Cement (In Barrels)

| | 1931 | 1932 |
|---|---|---|
| Production, November | 8,161,000 | 6,462,000 |
| Shipments, November | 7,156,000 | 4,782,000 |
| Stocks at end of month | 22,219,000 | 18,764,000 |
| Production for year to date | 118,596,000 | 72,240,000 |
| Shipments for year to date | 122,323,000 | 77,744,000 |



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## Quarry Accidents in United States at Low Rate in 1931

Reports received by the United States Bureau of Mines, Washington, D. C., from companies engaged in quarrying stone and in such related work as stone-crushing, stone-dressing, and the manufacture of lime and cement, indicate progress in the prevention of accidents in that industry throughout the country during the calendar year 1931. The industry as a whole reduced its fatality rate from 0.59 per million man-hours of employment in 1930 to 0.46 in 1931 and it reduced the non-fatal injury rate from 41.88 to 40.58.

In 1931 the quarrying industry employed 69,100 men, of whom 33,221 worked inside the quarry pits and 35,879 worked at crushers, cement mills, lime kilns, rock-dressing plants and at other outside plants. The average length of shift was 8.61 hours per day and the volume of work performed by all employees at all of the 1,530 plants reporting was the equivalent of 133,750,124 man-hours. The average employee worked 225 days, or 1,936 hours, during the year.

Accidents incident to this employment included 61 fatalities, 16 injuries causing permanent total disability, 189 injuries causing permanent partial disability, and 5,222 injuries of a temporary character that disabled an employee for one day or more. This record indicated a marked improvement over that of 1930, when there were 105 deaths, 12 permanent total injuries, 253 permanent-partial injuries, and 7,152 injuries of a temporary character.

As compared with the combined accident-frequency rate of 41.04 injuries and deaths per million man-hours of exposure for the entire United States, there was a wide variation of the rates in the various states. Twenty states had a higher accident rate than the average for the country as a whole, and 22 had lower rates than the average. The records for four other states have been combined to avoid revealing figures relating to individual companies.

Thirty-four underground limestone mines reported 2,153,785 man-hours of work performed underground and a death rate of 1.39 and an injury rate of 26.47, a total of 27.86 accidents per million man-hours. This rate represents considerable progress in the prevention of accidents at underground quarries as compared with a rate of 46.57 reported by 42 similar plants in the preceding year and a rate of 52.19 reported by 44 plants in 1929.

Accident rates and other data for the United States as a whole and separate figures for individual states are shown in a table compiled by the Bureau.

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## Western Portland Cement Buys Utah-Idaho Co.

Properties of the Utah-Idaho Cement Co., situated in Utah and Idaho, were sold at public auction at Ogden to the Western Portland Cement Co., for $148,555.15, on November 29.

The purchasing company was recently reorganized in Ogden, the incorporators representing the bondholders of the Utah-Idaho company.

The bids, as segregated, follow:

For real estate in Utah, $10,000; for buildings, improvements and machinery, in Utah, $136,355.15; for inventories and products, $200; accounts receivable and other like property, $1000; for land near Pocatello, Idaho, $1000.

Before the sale was made, J. T. Jones, an attorney, of Pocatello, announced a protest would be filed against the sale of the land in Idaho, as it was claimed by Mrs. Clara Johnson Wood, who contended the cement company had no right or title to the property.

The sale was made as the result of a suit, for a small amount, which started receivership proceedings.

The receiver's representative announced that the Western company would rehabilitate the plant and begin business in the near future.

# Improvements and Developments Reviewed by Manufacturer

## Outline of 1932 Equipment Design Changes and Innovations—Some Details of Clinker Cooler Principles

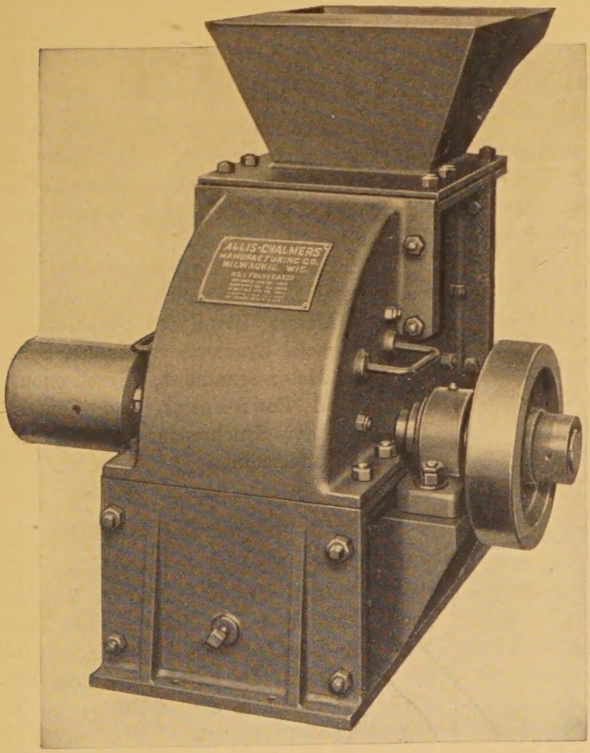
Its clinker cooler, crusher, pulverizers, and welded steel products are some of the cement manufacturing units which came in for 1932 development as Allis-Chalmers products.

The following is a review of these developments as seen by this manufacturer:

### *Clinker Cooler:*

For several years Allis-Chalmers Manufacturing Company has been investigating a new method for the cooling of portland cement clinker. Early this year an experimental cooler was constructed and installed in the Dewey Portland Cement Company's plant at Davenport, Iowa, to secure operating data on the type of cooler which had been designed based on experiments made in the Allis-Chalmers laboratory.

In this cooler the clinker is cooled by the injection of cold air through a vibrating bed of hot clinker with the direct exchange of heat from the clinker to the air. Through the agitation of the bed the resistance of the passage of air is reduced and more intimate contact is made between the air and the clinker. Contact between the air and the clinker in rotary and shaft coolers heretofore used has been limited, and operations were satisfactory.



**No. 1 pulverator, showing the application of anti-friction bearings**

In the new cooler, the clinker falls directly from the rotary kiln onto the grate of the cooler which forms a conveying surface. The conveying is accomplished by means of a horizontal trough carried on support and balancing-leaf springs. The trough is connected to an eccentric shaft through buffer springs. Another set of gravity balancing springs is connected to the grate and fastened to the foundation of the driving unit. Through the use of these three sets of springs vibration is eliminated, and the energy of the moving trough is stored in the springs so as to balance the power demand throughout the complete cycle of operation.

A duct is formed below the perforated grate and one end is connected to a blower by means of a flexible joint. The heated air is drawn off at the three points from the upper casing, the one nearest the feed end of the cooler connecting direct to the kiln, one about midway between the feed and discharge ends providing primary combustion air, and a third at the discharge end is vented to the atmosphere.

The excess air which is vented to the atmosphere carries very little heat and the thermal loss in this air is of little importance, the cooler clinker produced being more important than the small amount of heat thrown away.

Due to the rapid chilling effect of the air a better clinker is made, which grinds in some cases up to 25 per cent easier than the clinker produced in commonly used but older types of coolers.

The power to operate the shaker conveyor cooler is only a small fraction of that required to operate a rotary cooler of the same capacity. Almost the entire heat of the clinker can be delivered to the kiln in the combustion air.

### *Crushers:*

Although a new type of crusher has not been developed during the past year, a very important improvement has been perfected and other improvements in design and manufacturing of the complete line of crushers have been made.

The most important improvement referred to is the development of a positive oil and dust seal for crushers, consisting of baffles and a rubber curtain with machined steel ring. Several crushers have been furnished with this type of seal, and complete satisfaction has been received. This seal is now available for some sizes of crushers.

### *Pulverators:*

Anti-friction bearings have been designed for use on No. 1 and No. 2 pulverators, and this improvement should make these machines more attractive to purchasers.

### *Welded Steel Products:*

Electrical welding is being used to a greater extent in the fabrication of equipment, as it allows the use of higher strength materials and better distribution of metal where required for correct design; both combining to make a much better product from the customer's standpoint.

# Mill Equipment

## New Goodrich Belting Resists Oils, Chemicals

Rubber belting, which resists chemicals and oils, the first product of its kind perfected in the rubber industry, is announced by the B. F. Goodrich Co., Akron, Ohio.

Patent covering the new type belting was issued to Goodrich by the United States Patent Office early in November.

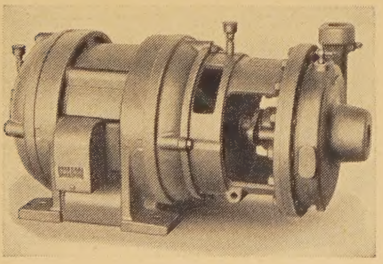
For years experiments were conducted to discover a process to protect rubber belts from the destructive action of acids, alkalies and oils before the Goodrich method was developed in the Goodrich laboratories.

The new belting has given satisfactory service after complete immersion in oil for several days, while ordinary belting will last only one-third as long when subjected to similar exposure, according to Goodrich engineers.

B. S. Taylor, manager of material development for the Goodrich processing division, is the inventor of the new belting which will shortly be marketed by the Akron company.

## Pumping Unit Line Is Extended by Allis-Chalmers

The Allis-Chalmers Mfg. Co. has again extended its popular line of "SSU" motor-driven, single-shaft, two-bearing pumping units. Three sizes to work against heads up to 100 lb. (231 ft. head) and above and covering a range in capacity from 30 to 140 gal. per minute have now been developed. These pumps fill the need for high head pumps of low capacities at low cost.



The pumps and motors are both built and guaranteed by the same manufacturer, eliminating any divided responsibility. The purchasers are also assured that pumps and motors are properly proportioned so as to work together as an efficient reliable unit. A single shaft is used on which to mount the motor rotor and the pump impeller. This shaft is supported by two amply sized ball bearings. This construction does away with any possibility of misalignment between the pump and the motor.

The new sizes of the Type "SSU" pumping units are now being stocked and quick shipment can be secured.

## Oxweld Cutting Attachment Is Improved

The Linde Air Products Company, New York, N. Y., has announced an improvement in the Oxweld Type CW-17 cutting attachment whereby the heating oxygen throttle can also be used as an oxygen shut-off valve for use during temporary stops in cutting.

The throttle has been redesigned and the valve packing improved to make the valve operate more easily. This redesign makes the Oxweld CW-17 cutting attachment even more convenient than before.

The Oxweld Type CW-17 cutting attachment was developed to provide a general blowpipe suitable for all kinds of work. By unscrewing the head of an Oxweld Type W-17 welding blowpipe and putting on the Type CW-17 cutting attachment exactly as the welding head is screwed on, the Type W-17 blowpipe can be used for cutting work as well as welding. The cutting attachment is sufficiently small, compact and light to be carried around in the operator's pocket so that it will be instantly available when needed.

## New Line of G. E. Full Voltage Magnetic Switches

The General Electric Co. has announced a new line of full voltage magnetic switches built to the standards of the Underwriters' Laboratories for industrial control equipment for use in Class I, Group D, hazardous locations where inflammable or volatile liquids, gases, or mixtures are stored, manufactured, used or handled. These switches are weatherproof as well as being suitable for use in corrosive atmospheres.

The new devices consist of standard General Electric magnetic switches with special operating coils and special contact tips for operation under oil, and an oil-immersed temperature overload relay. The cylindrical cast iron oil tank and top cover have wide metal to metal flanges machined to close limits to insure a tight fit. The enclosure is, in itself, explosion-proof, having been designed to meet Underwriters' requirements for air-break switches, and the oil is used only to protect the magnetic switch and the overload relay against corrosive fumes.

For use in connection with these switches, a pushbutton station, also meeting Underwriters' specifications, has been developed for remote control in Class I, Group D hazardous locations.

This new line of devices supplements the similar line of explosion-proof switches which have air-break contacts.

## Industrial Literature

### *Testing Machine Booklet*

*Oxweld Portable Tensile Testing Machine* is a new booklet, 15 pages, published by the *Linde Air Products Company*, New York, N. Y.

This booklet describes the Oxweld portable tensile testing machine which has been on the market for some time. Developed by *Union Carbide and Carbon Research Laboratories, Inc.*, this machine is said to meet the constantly increasing need for a practical, efficient method of testing welds and qualifying welders.

Details of construction and complete directions for operating are contained in this booklet. There are also explanations of the proper methods of preparing coupons for testing and of calculating the tensile strength. Calculations of the ultimate tensile strength are simplified by an interesting chart of the alignment or nomographic type.

### *G-E Synchronous Motors*

Synchronous motors are catalogued in a publication of that name being distributed by the *General Electric Co.*, Schenectady, N. Y. This is *GEA*-1191*A*, superseding GEA-1191.

The Economics of the Synchronous Motor, General Description, High-Speed Synchronous Motors, Low-Speed Synchronous Motors, Special Synchronous Motors, Synchronous Motor-Generators, Synchronous Motors and Power-Factor, and Control Equipment for Synchronous Motors, are some chapter headings.

### *Questions and Answers*

"The Swap Market" forms the bulk of the contents of an 8-page 8½- by 10½-in. booklet known as *The Motorizer* and published by the *Lincoln Electric Co.*, Cleveland, Ohio. In this department questions asked by readers in earlier issues are answered by other readers.

"The Rotor Core and Its Windings" is the title of a 1-page article.